Injuries Associated with Refuse Collectors and Landfill Workers in Anchorage, Alaska.

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INTRODUCTION

The working conditions for solid waste collection, transportation and disposal activities pose serious threats to the health of workers since they are routinely exposed to mechanical hazards, physical dangers, toxic substances, excessive noise, and extreme temperatures. Exposure to such hazards can cause among other things loss of hearing and impairment of sensations, degenerative joint disease, injuries, and even death. In August, 1996, a refuse collector died in Juneau,Alaska after being pinned between the garbage truck and a dumpster. In November 1996, the New York Times reported a trash collector in New York City was killed and a second injured when they were exposed to hydrofluoric acid vapors from a discarded container that burst under the compacting blades.

In 1984, a study showed that garbage collectors had the second highest incident ratio of back strains/sprains among U.S. industrial employees (11.1 claims/100 workers). The first group was miscellaneous laborers with a ratio of 12.3 claims/100 workers.(1) In a 1975 study, the incidence of unintentional injury was much higher among sanitation workers than other occupational groups to which they were compared.(2)

Municipal solid wastes (MSW) consist of solid materials discarded by a community. Part of the MSW produced by a household is called refuse, which includes, food wastes, glass, cans, paper, and ashes. Trash on the other hand, refers to such larger items as tree limbs and old appliances that are normally not deposited into garbage cans.(3) These materials are collected regularly from households, commercial establishments, government offices, hospitals and a myriad of other institutions. The working environment for waste collectors varies from mildly uncomfortable to extremely hazardous. High traffic and extreme weather conditions make outdoor collection very dangerous.

After the waste is collected, it must be placed where it no longer impacts society. Presently, the only option for final disposal is landfills, which are unsightly, odorous and potentially dangerous. Workers may be exposed to toxic chemical by-products, solvents, pathogens, pesticides and radioactive wastes. Microbiological flora of solid waste has been judged to be equal to that of sewage. *Salmonella enteritides, S. typhimurium, S. saintpaul, S. eidelberg* and *S. montevideo* (which cause diseases such as paratyphoid fever, typhoid fever, and salmonellosis) are all found in refuse.(4)

The equipment used and the topography at landfills can also be hazardous to the workforce. Landfills are subject to ruts and cave-ins because of settling and decay of previously deposited garbage products. The ground freezes, leaving these large ruts which result in a very uncomfortable ride. The equipment used may have limited shocks that compound the problem and aggravate backs.

The Municipality of Anchorage, Solid Waste Service (SWS) department, accounts for only 15.7% of the refuse that is disposed of at the landfill. The remaining waste is collected by private companies (48.5%) or by military contracts (9%), or is brought to the landfill by residents (26.8%). The SWS department also runs the landfill where 280 tons of refuse is disposed of annually.

METHODS

Workers' compensation claims for the Anchorage Municipality were examined and a three-year average claim rate was calculated for each section of the municipality. SWS had the highest claims rate of any department. We examined SWS workers' compensation claim records from 1992-1996 and categorized them by department, type of injury, and action performed. We were also allowed to ride along on a collection run to observe the operation.

The four departments in which SWS employees work include administration, vehicle maintenance, collection (picking up the refuse from the customer and transporting it to the transfer station), and disposal (transporting refuse from the transfer station to the landfill and permanently disposing of it).

The categories of activity at the time of injury included entering/exiting equipment, lifting, equipment operation, slips and falls (includes on ice), equipment cleaning/maintenance, and general site maintenance (including snow removal). Injury rates per 100 workers were calculated.

RESULTS

From the workers' compensation data, we calculated a claims rate per employee for each department. The Solid Waste Services Department had the highest rate of 38 claims/100 employees/ year, followed by the Parks and Recreation Department (25/100/yr), and the Fire Department (23/100/year).(Table 1)

The SWS uses three types of trucks to collect the refuse: front-end, rear, and side loaders. A front-end loader picks up dumpsters and mechanically lifts them over the top of the truck and dumps the refuse in the back. There is one driver in the truck who never gets out. The rear load trucks are the typical design where there is a driver and a "swamper" on the back loading the refuse from stop to stop. The side loaders are also designed for a single person. The collector drives the truck from the right side and gets out at each stop to lift cans into the back.

Once the collection is finished, it is taken to the central transfer station and unloaded. A large bulldozer then pushes the refuse towards a pit where a tractor trailer is waiting to transport it to the landfill. Another person operating a "cherry picker" or small crane, watches the loading operation and removes anything that might be too heavy, like an engine block, and helps distribute the load in the trailer. The driver takes the truck out of the pit, walks around the truck and pushes in anything that might be hanging over the sides, and then closes the screens on top so nothing blows out. At the landfill, the trucks dump their load and the compactors and bulldozers bury it. Even though the Municipality collects only about 16% of the waste that is deposited in the landfill, they do haul the waste to the landfill from the transfer station and operate the landfill.

From 1992 through 1996, there were 136 workers' compensation injury claims filed in the SWS. Back injuries were the most common injuries (48, 35.3%), followed by sprains/strains (38, 27.9%), and contusions/crushings (14, 10.3%).

The most common action being performed at the time of injury was lifting (26, 19.1%) followed by falls/ slips (24, 17.6%), and equipment operation (22, 16.2%). When looking at falls/slips by month of occurrence, victims were more likely to fall in the winter months from October-March (67%) than in the summer months of April-September (33%). Victims were more likely to injure themselves lifting during the summer months (62%) versus the winter months (38%). Back injuries most commonly occurred during lifting activities (20,42%) and while operating equipment (9,19%). Sprains and strains most commonly occurred in operating equipment (8,21%) and falls (8, 21%).

Disposal and collection had the highest number of incidents (61, 44.9% each). Vehicle maintenance comprised a smaller portion (10, 7.4%) and administration had only a few incidents (2.9%). People working in collection were more likely to hurt themselves while lifting than people working disposal. Both groups hurt themselves by falling or slipping. Disposal workers were more likely to injure themselves while operating equipment than collection workers.

Injury rates were then calculated for the complete group. This rate was 24.4/100 employees/ year. When calculated by area where employees worked, vehicle maintenance had the highest rate of 18.0/100 employees/year, followed by disposal 11.8/100 employees/year, collection 6.6/100 employees/year and administration 4.7/100 employees/year.

DISCUSSION

Unintentional injuries sustained while on the job are a serious threat to refuse collectors. In 1976, the National Safety Council conducted a survey of all industrial operations in the solid waste industry. In refuse collection, back strains accounted for 25% of all lost-time injuries and at least 28% of the compensation expenses. This represented the leading single type of injury sustained by refuse collectors and resulted from improper lifting and over-exertion. Injuries to hands and fingers accounted for 22% of the total injuries. Sprained ankles were recorded more frequently for refuse collection workers. Frequent movements in and out of vehicles contributed to this as well as improper carrying of loads of refuse. Abrasions, puncture wounds, lacerations, burns, frostbite, dog bites, bee and wasp stings and rat bites were very common injuries among collectors. Serious cuts can be caused by torn metal in refuse

cans and broken glass or protruding nails in discarded refuse. Other injuries occur when collectors drop heavy containers on their feet or legs. One reason this may happen is the overloading of collection cans causing them to be too heavy to lift properly. The presence of moving mechanical parts on automatic, packer-type compaction units are potentially hazardous and can cause severe injury, including amputation.(6)

Few studies have been done on the mortality of city and municipal employees as a group. Prompted by the finding of an increased rate of coronary heart disease and myocardial infarction in the sanitation workers of New York City, an analysis of all the deaths that occurred among the New York City sanitation men in employment as of 1973 was undertaken. Of the 10,565 so employed, 511 died between 1975-1984. Of those deaths, 31.7% were due to cancers. 44.2% were lung cancers. This compares to 21.6% of all deaths of U.S. males in the same age group due to cancers, and, of this group, 33.6% were lung cancer.(2)

Solid waste workers are a part of the industry division of Transportation/ Communication/ Public Utilities. Traumatic occupational fatality statistics are collected by the National Institute for Occupational Safety and Health (NIOSH) through a nationwide database (NTOF- National Traumatic Occupational Fatalities Surveillance System). Between 1980-1989, NTOF data showed that this industry had the most the traumatic occupational fatalities in the nation (18%). (Workers from the construction industry also comprised 18% of the traumatic occupational fatalities for that 10-year period.) The mining industry had the highest average annual fatality rate per 100,000 workers (31.9), followed by construction (25.6), and transportation/communication/public utilities (23.3).(5)

Information available through the workers' compensation records was very limited. No demographic data (age, gender, race) were available. The incident description was usually very clear about what type of injury was involved; however, there was very little information describing the activity of the individual at the time of injury.

The SWS department has been very diligent about eliminating safety hazards, but there is still room for improvement. We are now developing interventions to decrease the number of injuries associated with falls.

Table 1: Municipality Department Claims Rates

Organization	Number of Employees	3 yr. Avg. # of claims (1993-95)	Claims/ 100 employees/ year
Solid Waste	78	30	38
Port	21	2	10
Water/Sewer Utility	263	17	6
Police	448	86	19
ML&P	224	38	17
Fire	265	60	23
Parks & Rec.	126	32	25
Prop/Fac Mng	78	13	17
Telephone Utility	455	44	10
H&HS	180	16	9
Public Works	253	33	13
Public Transit	133	12	09

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